

What is claimed is:

1. A semiconductor laser chip unit comprising:  
an electrode pattern and a ground electrode;  
a semiconductor laser chip which is die-bonded to the  
ground electrode and outputs a laser beam according to a  
5 high-frequency signal transmitted from the electrode  
pattern and the ground electrode; and  
a collimator lens for collimating the laser beam from  
the semiconductor laser chip; wherein  
Each of the electrode pattern, the ground electrode,  
10 the semiconductor laser chip and the collimator lens is  
integrated in a non-conductive heat sink so as to form a  
unit.  
2. The semiconductor laser chip unit, as claimed in  
claim 1, wherein the semiconductor laser chip is fixed with  
a support of a groove or a hole at such a position that the  
laser beam from the semiconductor laser chip is made  
5 incident on a surface of the collimator lens at  
approximately a focal point of the collimator lens.  
3. The semiconductor laser chip unit, as claimed in  
claim 2, wherein the groove is formed along a travelling  
direction of the laser beam.  
4. The semiconductor laser chip unit, as claimed in  
claim 2, wherein the hole is formed on a way of a  
travelling direction of the laser beam.  
5. The semiconductor laser chip unit, as claimed in

claim 1, wherein the collimator lens may be a spherical lens or a non-spherical lens.

6. The semiconductor laser chip unit, as claimed in claim 1, wherein the heat sink is formed of a material having a less leakage loss of high frequency and a higher heat conductivity than a Si material.

7. The semiconductor laser chip unit, as claimed in claim 1, wherein an exposed lens surface of the collimator lens is expanded by forming a step on a portion of the heat sink where the collimator lens is fixed.

8. The semiconductor laser chip unit, as claimed in claim 1, wherein the heat sink is formed of aluminum nitride, and a bonding part of the semiconductor laser chip is formed of indium phosphorus.

9. The semiconductor laser chip unit, as claimed in claim 1, wherein the semiconductor laser chip outputs a front light and a back light from a front end surface and a back end surface, respectively, and uses the back light as  
5 the laser beam.

10. The semiconductor laser chip unit, as claimed in claim 1, wherein the electrode pattern and the ground electrode are formed as a coplanar line.

11. The semiconductor laser chip unit, as claimed in claim 1, wherein the ground electrodes are formed on opposing end surfaces of the heat sink respectively, and

are connected through a via hole formed in the heat sink.

12. The semiconductor laser chip unit, as claimed in claim 1, wherein the heat sink includes a resistance as an end of the high-frequency signal transmitted through the electrode pattern and the ground electrode, and a  
5 condenser for protecting the semiconductor laser chip from a surge current of a bias current.

13. A semiconductor laser chip module comprising:  
a semiconductor laser chip unit;  
wavelength detection means for detecting a  
wavelength of a laser beam passing through a collimator  
5 lens; and

temperature control means for controlling a  
temperature of a semiconductor laser chip;

all of which are incorporated in a package; wherein  
the semiconductor laser chip unit comprises: an electrode  
10 pattern and a ground electrode, a semiconductor laser chip  
which is die-bonded to the ground electrode and outputs a  
laser beam according to a high frequency signal  
transmitted from the electrode pattern and the ground  
electrode, and

15 a collimator lens for collimating the laser beam from  
the semiconductor laser chip, wherein each of the  
electrode pattern, the ground electrode, the semiconductor  
laser chip and the collimator lens is integrated in a non-

conductive heat sink so as to form a unit.

14. The semiconductor laser module, as claimed in claim 13, wherein the semiconductor laser chip is fixed with a support of a groove or a hole at such a position that the laser beam from the semiconductor laser chip is made incident on a surface of the collimator lens at approximately a focal point of the collimator lens.

15. The semiconductor laser module, as claimed in claim 13, wherein a driver IC for modulating the semiconductor laser chip is incorporated in a package.

16. The semiconductor laser module, as claimed in claim 13, wherein the wavelength detection means comprises an optical detector for receiving a laser beam passing through a wavelength filter, and another optical detector for directly receiving a laser beam from the collimator lens, and branches the laser beams emitted for respective optical detectors by a beam splitter.

17. The semiconductor laser module, as claimed in claim 15, wherein the optical detector is a photodiode.

18. The semiconductor laser module, as claimed in claim 15, wherein the wavelength filter is an etalon filter.